

# BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussions invited.

## ACUTE NONINFECTIOUS BURSITIS

### I. SYMPTOMS

LE ROY C. ABBOTT, M.D. (384 Post Street, San Francisco).—The bursae are synovial sacs lined with a delicate layer of endothelium. As a rule, they are situated near the joints and at the intersection of muscles or tendons, also at points where muscles or tendons move over a projecting portion of bone. The endothelium-lining cells secrete synovial fluid, which acts as a lubricant and reduces friction during motion. Some of the bursae, such as the subacromial and the prepatellar, are constantly present, while others, such as the bursae lying over a bunion or over a kyphos in a tuberculous spine, are adventitious and develop as a result of continued irritation.

The bursae are similar in structure to the synovial membrane of joints and are subject to corresponding types of disease. In this discussion we shall include only the symptoms which occur in the acute noninfectious type of bursitis. It should be borne in mind that chronic or subacute bursitis is more common than the acute form. For example, chronic inflammation of the olecranon and prepatellar bursae occurs much more often than the acute involvement of these bursae.

Acute noninfectious bursitis may be the result of direct injury. The injury is followed by swelling, increased heat and tenderness localized to the area of the bursa. There is additional secretion of fluid within the bursa, at times producing fluctuation. Generally, the process subsides rapidly with rest. Repeated injuries of a minor nature, often incident to occupation, may cause acute bursitis. This type of traumatic or occupational bursitis is the most frequent noninfectious lesion of the bursa.

While there are numerous bursae around such joints as the shoulder, elbow, hip and knee, ordinarily there are only certain ones which frequently become the seat of inflammation. These are the subacromial, the radiohumeral, the olecranon, the iliopectineal, the trochanteric, the ischiogluteal, the prepatellar, pretibial, and the retrocalcaneal bursae. The symptoms which are common to all of them, as a result of inflammation, are pain, localized tenderness, swelling and occasionally fluctuation. Any movement which increases friction of the bursal walls becomes limited and painful; other motion is comparatively free. This condition is always characteristic of an extra-articular lesion.

In some of the more deeply situated bursae, these symptoms may be difficult to elicit. The diagnosis is influenced by the supposition that a bursitis exists because of the location of tenderness and pain. At times a positive diagnosis can be made only by aspiration or operation.

In all questionable cases the physician must have in mind the possibility of a localized periostitis, or an injury to ligaments or tendons. For example, though some cases of so-called "tennis elbow" may be due to inflammation of the radiohumeral bursa, others may be traced to localized inflammation of the periosteum, a condition known as epicondylitis. Also, symptoms not infrequently arise in "tennis elbow" from a tear of the common tendon of the origin of the extensors of the wrist and fingers.

Of all forms of acute bursitis, that which affects the subacromial bursa is the most common and the most distressing. It may be caused by a direct blow on the shoulder or it may be due to occupational trauma, and is seen most frequently in people whose employment necessitates working with the arm in abduction. In this group, the bursitis is secondary to the injury of the underlying tendons. As Codman has pointed out, there may be minute ruptures of the supraspinatus which produce a tendonitis and a resultant inflammation of the bursa. In other instances the acute inflammation may be due to repeated irritation over a calcified deposit in any of the tendons comprising the musculotendinous cuff, particularly the tendon of the supraspinatus.

While the occurrence of such deposits in the shoulder has become familiar, it is not sufficiently recognized that similar deposits of calcium may occur around other joints and give rise to inflammation, as indicated by Dr. Harold Hitchcock in his paper on "Calcium Deposits About Joint."

In cases of acute subacromial bursitis, the patient generally recounts a history of discomfort before the onset of the acute attack. Men frequently complain of pain when putting on their coats, women have trouble in doing their hair. There is a painful catch on abduction and rotation of the shoulder joint. This symptom is often the first indication of a calcified deposit in the tendon of the supraspinatus muscle.

If the patient is observed during this stage, the examiner will find a disturbance in the scapulohumeral rhythm. Normally, in abduction of the arm the movement of the scapula on the thorax and the motion at the scapulohumeral joint are carried out simultaneously in perfect rhythm. In affections of the subacromial bursa there is gross disturbance of this rhythm. The patient attempts to avoid motion at the scapulohumeral joint and, as a consequence, elevation of the arm is almost entirely carried out by rotation of the scapula on the chest wall. When the arm has reached a position of right-angle abduction there is usually a painful hitch, and complete elevation is then obtained only by abduction and external rotation at the scapulohumeral joint. This disturbance of rhythm is immediately apparent when both arms are elevated and the patient is observed from behind.

As the inflammation progresses, with more diffuse involvement of the bursa, the patient complains of extreme pain over the summit of the shoulder. The arm is fixed at the side by intense muscular spasm, and swelling occurs in the region of the bursa, the tenderness is excessive and includes the entire bursal area. The movements of rotation and abduction are completely restricted, though flexion and extension are relatively free. In cases of some duration there is atrophy of the muscles of the shoulder girdle, especially the supraspinatus, infraspinatus and the deltoid.

In many instances this condition is accompanied by pain in the neck, arm, forearm and hand along the distribution of the median and ulnar nerves. Almost invariably pain is referred to the insertion of the deltoid. Frequently there is a thickening of the deltoid fibers in this region, a finding which may be due to intense muscular spasm. With these neuritic symptoms one frequently observes swelling of the back of the hand and forearm, inability to extend the elbow and carry out complete range of motion of the fingers.

Roentgenograms should be taken to ascertain the presence of calcified deposits if they exist. The best of technique must be employed and the exposures taken from various angles; otherwise, these deposits may escape observation.

As Codman points out, the cardinal symptoms of subacromial bursitis are pain, limitation of motion, muscular spasm and atrophy, any one of which may predominate.

In conclusion, I know of no better way of emphasizing the fact that this lesion is of frequent occurrence, and is often confused with other conditions, than to quote the following paragraph from Codman's valuable book, "The Shoulder":

"The cases which are to be discussed in this paper are by far the most common lesions of the shoulder joint. It is the writer's experience that more patients seek hospital treatment for lesions involving the subacromial bursa than for all other lesions of the shoulder joint, including tuberculosis and fractures, added together." "Not only is this true, but it is also true that more cases of subacromial bursitis seek hospital treatment than all the cases of the supposedly more common forms of bursitis, such as 'miner's elbow,' 'housemaid's knee,' and 'weaver's bottom.' In those clinics in which these statements are apparently not true it will be found that these cases are passing unrecognized under the diagnoses of brachial neuritis, peri-arthritis, muscular rheumatism circumflex paralysis, contusion of the shoulder, fibrous ankylosis, gout, rheumatism and other vague terms."

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## II. DIAGNOSIS AND PROGNOSIS

T. E. P. GOCHER, M.D. (220 Montgomery Street, San Francisco).—A noninfectious bursitis is an inflammation of the sac of a bursa from other causes than infection, such as from trauma, systemic conditions or irritation of the area of the bursa. This inflammation may be limited to the sac itself or, later, may spread involving the surrounding tissues.

*Diagnosis.*—The symptoms of a bursitis are usually localized pain over a bursal area; tenderness to pressure or motion; swelling to varying degrees; limitation of function of the part and at times fluctuation. If the correct diagnosis is not made at first, the inflammation may spread and involve nerves, muscle tissue or the tissues of a joint. This spreading is usually in the form of a fibrosis. The tenderness is localized at first over the area of the bursa and later, depending upon the degree of inflammation, may spread and become generalized over the area. When this occurs the difficulty in diagnosis is greater.

In studying fifty cases of noninfectious bursitis in workers, and taking special care to study out the areas involved in the spreading of the inflammation, it was found that:

(a) There was no spreading in 30 per cent of the cases.

(b) The inflammation spread in 70 per cent and involved:

1. The joint capsule in 20 per cent.

2. Soft tissues in 46 per cent.

3. Muscle tissues in 20 per cent.

4. Nerve tissues in 14 per cent.

5. Neighboring bursae in 6 per cent, especially in the shoulder area.

This made diagnosis more difficult, requiring careful study in order to obtain the best results with treatment.

In studying twenty-four cases of prolonged disability, and treating each for a "bursitis" with excellent results, the following diagnoses were found:

(a) "Arthritis" in 8.3 per cent of these cases.

(b) "Neuritis" in 25 per cent.

(c) "Myositis" in 54.7 per cent.

(d) "Sprained joint" in 12 per cent.

X-rays will rule out any bone disease or fracture or dislocation. At times, there may be found calcareous deposits, or melon-seed bodies in the area of the bursa. These are usually in the floor of the bursa or beneath it in the soft tissues. They may or may not cause symptoms such as tenderness.

A noninfectious bursitis may be painful, but have no marked redness or "heat" in the area. Fluid may develop, and in some cases quite suddenly, and tenderness may also appear. This tenderness may be the chief or only symptom outside of the discomfort of swelling.

The following conditions should be considered when making a differential diagnosis:

(a) Periarthritis or an arthritis, especially at the shoulder.

(b) Neuritis, especially in the hip area.

(c) Myofascitis or a myositis, especially in the hip area.

(d) Phlebitis, especially at the knee area.

(e) Periostitis.

(f) Fracture.

(g) Sprained joint.

(h) Osteochondritis deformans.

(i) Osgood-Schlatter's disease.

One or more of these conditions may be present, but if a "bursitis" is the primary cause, then this condition should be recognized. It should also be remembered there is always danger of infection

occurring in this type of bursitis. Luckily, the percentage is not high.

A bursitis of this type may become chronic before recognized or the patient reports to the doctor. Then, frequently, the walls of the sac have become thickened and the fluid contents of the sac also thickened. In these cases there is often a "clicking" on motion of the area. Many of these bursae cause no symptoms outside of the "clicking," and may be present months or years before some condition draws attention to this "clicking." This type is frequently found in the shoulder area.

**Prognosis.**—The prognosis of a bursitis depends on the age of the patient. The younger patient usually gets well faster. The exact "cause" of the bursitis is another important factor. For instance, if due to irritation, and diagnosed early, then when the irritation is removed the symptoms of the bursitis will often readily disappear. A "first attack" usually reacts to appropriate treatment very well, while an aggravation of a chronic condition may have treatment greatly prolonged, especially if the cause of the bursitis is from the general systemic condition.

When the bursitis is not recognized at first and spreading of the inflammation ensues, then the disability is in the most instances prolonged.

Prognosis is always best if the patient reports early and the condition recognized from the first. The shoulder and hip bursae, and at times the bursae of the heel, are usually the worst offenders in prolonged treatment, while the elbow and knee areas readily react to treatment unless complicated.

It should also be remembered that a chronic bursitis with "clicking" may cause no disability whatsoever outside of the mental effect of the "click." This type is usually difficult to treat; but unless active symptoms such as pain or tenderness are present, it often requires no treatment. Many people have "clicking" in their joints and especially the shoulder, and live most of their lives with this condition and yet have no symptoms.

The prognosis of a bursitis, on the average, is good. The patients practically all will react to appropriate treatment, and only when complications are present should the treatment be prolonged.

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### III. TREATMENT

CHARLES S. ROLLER, M.D. (Woodland Clinic, Woodland).—The most frequently troublesome bursae, in our experience, are the prepatellar, the subdeltoid, the olecranon, the radiohumeral, and some of the bursae situated posterior and lateral to the upper tibia, and fibula and lower femur. Other bursa that I mention, only that they may be kept in mind, are these: The iliopectineal, trochanteric, numerous gluteal bursae, and bursae near the shoulder joint and scapular region other than subdeltoid bursae. As is well known, some of these bursae may be present in one individual and absent in another, and they vary considerably as to size.

Bursae are situated anatomically between moving tissue planes so that these tissues may more easily move or glide over each other. They also act very

materially as protective cushions to the underlying and overlying parts.

Assuming the diagnosis to be properly made, which is usually not difficult, and granting that we are not dealing with purulent or infected bursae, I believe that the following points in the management of these cases are worthy of note.

**Treatment.**—Credit for this method of treatment should be given entirely to Weeks and Delprat,<sup>1</sup> as outlined in their article of several years ago.

In this brief discussion, emphasis will be laid upon novocain infiltration, aspiration, and multiple puncture of acute noninfectious bursa. For the past few years this type of diseased bursa has been treated by us as follows: The skin is surgically prepared and draped, a little 2 per cent novocain injected into the skin immediately over the bursa and, with a longer needle, the bursa is thoroughly anesthetized and infiltrated with 2 per cent novocain. Then, with a rather large caliber needle, 16 gauge, and through the same skin puncture, the bursa is entered and all exudate possible aspirated. With the same needle twenty to thirty punctures are made into the bursal sac, without withdrawing the needle from the skin, and with the puncture holes extending over the entire bursa. The needle is then withdrawn and a small square of sterile gauze secured with adhesive over the puncture hole in the skin, and left in place forty-eight hours. This procedure usually gives almost immediate relief from pain, and motion of the parts that was extremely painful before injection and multiple puncture is now relatively painless. The most probable explanation of the pain relief by this treatment is release of intrabursal tension, which is of more or less lasting degree because the many puncture holes allow drainage into the surrounding tissue, and absorption for a considerable time. Also, undoubtedly vascularization is increased in the bursa and adjacent tissues by the multiple punctures and the process of healing.

The most spectacular relief of pain probably occurs in the subacromial cases. These patients are radiographed with the humerus in internal and external rotation. If the bursa can be visualized, as is often the case because of calcareous content, the entire procedure is carried out with strict surgical asepsis under fluoroscopic control. By this means the large needle can be accurately guided into the bursal sac, novocain anesthesia accurately placed, and multiple punctures carried out under direct fluoroscopic vision. In three cases we have been able to break up the calcareous deposit with the large needle and, by using a little sterile saline, have also been able to aspirate the greater part of it. Material of this type that we have been able to withdraw is whitish in color, rather soft, and of putty-like consistency. This procedure is well worthy of trial in any bursa with a calcareous deposit. However, whether or not the deposit can be broken up and aspirated seems to have little effect upon the cure of the patient, as far as the immediate acute attack is concerned. Deposits do sometimes disappear spontaneously, or after multiple puncture,

<sup>1</sup> Weeks, Alanson, and Delprat, G. D.: Subdeltoid Bursitis (Acute), *Internat. Clinics*, 3:40-48, (Sept.) 1936.

as shown by subsequent radiographs of the region. After this is done the parts are placed at rest. This is accomplished by various means, depending upon the location of the bursa. A sling is usually sufficient in the subdeltoid cases. Adhesive strapping, elastic bandages, and splints are used as warranted. In only very severe cases is hospitalization necessary. Sedation may be required, depending upon the degree of pain, from mild analgesics up to morphin if necessary. General systemic measures, plenty of fluids, and elimination are important. Usually patients are able to return to work in from three to seven days after treatment, but occasionally it may take a little longer. We have completely disregarded traction and absolute immobilization as methods of treating acute noninfectious bursae.

During convalescence hot applications, dry heat, or diathermy to the parts are aids to recovery, and are used daily in severe cases. This treatment many times increases pain if carried out before injection and multiple puncture. Active motion of the part is encouraged by degrees as soon as the pain has disappeared and only soreness, stiffness, or mild pain on motion remain. Very light massage is sometimes helpful.

If the above measures fail after a reasonable trial, which in our experience certainly is very infrequent, or if recurrence of the bursitis is troublesome, excision of the bursa is done. In the olecranon and prepatellar cases this is possibly carried out earlier than the others, because of the accessibility of the bursa and the simplicity of the operation necessary to effect a permanent cure. Considerable care must be exercised in the excision in order to be certain that the bursal sac is entirely removed. After exposure of the sac a small needle is inserted into the bursa and the entire interior stained by injection with methylene blue. This greatly minimizes the danger of leaving part of the bursal sac. Bursae may have multiple compartments, and it is easy at times to do an incomplete operation if care is not exercised. At times, too, even methylene blue staining may not penetrate to all of the compartments, so that thorough exploration of the region of the bursa is done before closure, even though we feel that all of the sac has been removed. Recurrence of the trouble after excision of a bursa, or a wound which does not heal per primam are almost certainly due to incomplete excision. Excision of subdeltoid or radiohumeral bursae is more technical, but likewise gives a permanent cure if properly carried out. As is well known, calcareous deposits in subacromial bursitis may be found mainly in the tendon of the supraspinatus muscle, and the consensus of opinion seems to be that they may originate there, and later penetrate into the bursa.

Occasionally a change in occupation is necessary in chronic irritation and recurrent occupational bursitis, unless total excision of the bursa is done.

In conclusion, we wish to emphasize the following points:

First, that by this method of treatment in cases of noninfectious bursitis, our patients are disabled for a much less length of time than formerly, they suffer a great deal less pain, and cure seems fairly

permanent. We have done very few excisions in the last few years.

Second, we wish to emphasize the importance of accuracy in placing the novocain infiltration to insure a painless operation, and in covering as much of the bursal sac as possible with puncture holes, made with a large caliber needle.

Third, if excision of the bursa is ultimately necessary, care must be exercised that complete removal is done.

Fourth, in the deep-seated bursa it is always advisable to fluoroscope the patient and have a film made of the part because, if calcareous deposits are present in the bursa, localization can be done exactly, and the procedure can be accomplished under fluoroscopic vision and control.

Fifth, in some of the bursae uncommonly affected by this disease we have found it well worth while to refresh our memories as to their location, by study of the anatomy of the region before attempting novocain infiltration, aspiration, and multiple puncture.

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*The Undergraduate Teaching of Obstetrics: Chairman's Address.*—E. D. Plass, Iowa City (*Journal of the American Medical Association*, August 27, 1938), points out that, generally speaking, it may be said that the didactic teaching of obstetrics in the medical schools of the country is as adequate as that of any other major clinical subject. Textbooks are well written and authoritative, and the instructional staffs are progressive, interested and alert. The problem of practical training is more difficult to evaluate and from the statistical approach it seems almost insoluble. Pregnancy and parturition are essentially physiologic in character, with the major life-threatening complications of such infrequent occurrence that only the larger hospital centers can have anything approaching an adequate experience. The teachers of obstetrics realize the futility of attempting to make obstetric specialists out of undergraduates, and yet their critics are, at least by implication, insisting that this should be an objective of the instructional staffs. No other medical subject is taught with so much attention to preparing the student for actual practice as is obstetrics, and yet the others are not subjected to so much adverse criticism.

*Health of the Migrant.*—Walter M. Dickie, Sacramento, California (*Journal of the American Medical Association*, August 27, 1938), states that in 1936 and 1937, approximately 100,000 individuals seeking manual labor entered California by automobile each year, nearly 260,000 having arrived in two and one-half years. More than 57 per cent of these migratory laborers came from the Southern Middle Western states of Oklahoma, Texas, Arkansas, Missouri, Kansas, and Arizona. California, in coöperation with federal agencies, has controlled communicable diseases among these groups, no major epidemics having occurred. Services included child and maternal hygiene, diagnosis of tuberculosis, public health nursing, education in nutrition, including selection and preparation of proper foods, provision of housing facilities and general public health services. Study of conditions among these laborers revealed their greatest need—that of education in the hygiene of proper living. The amalgamation of this army of underprivileged people into the social life of California requires the coordinated efforts of social welfare, relief, medical, nursing, public health and administrative workers among local, state, and federal agencies. In public health administration there are no state border lines so far as migration is concerned and no direct effort can be made forcibly to bar entrance of migrants into California. In administering public activities to control these migrant groups, full recognition, first of all, was given to their status as human beings and, with public health as a driving force, provision was made not for prevention of disease alone but for medical and nursing care, relief, and housing facilities.